IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:

Haochuan Jiang

Serial No.: 10/605,575 Group Art Unit: 1731

Filed: 10/09/2003 Examiner: John M. Hoffmann

For: POST PATIENT COLLIMATOR ASSEMBLY

Our Reference No: GEMS 0216 PUS

CERTIFICATE OF MAILING/TRANSMISSION (37 CFR §1.8(a))	
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1/3/2008	Karen A. Hopf
Date	Karen A. Hopf

THIRD REVISED BRIEF ON APPEAL

Mail Stop Appeal Brief – Patents
Commissioner for Patents
Box 1450
Alexandria, VA 22313-1450

Sir:

The following Appeal Brief is submitted pursuant to the Notice of Non-Compliant Appeal Brief mailed on December 3, 2007.

The Commissioner is authorized to charge any necessary fee to Deposit Account No. 07-0845.

I. Real Party in Interest

The real party in interest in this matter is the General Electric Company.

II. Related Appeals and Interferences

There are no other known appeals or interferences which will directly affect or be directly affected by or have bearing on the Board's decision in the pending appeal.

III. Status of the Claims

Claims 1-4 and 6-16 stand rejected in the Final Office Action dated February 9, 2007. Claims 17-22 stand withdrawn. Claim 5 has been cancelled from the case. A copy of the claims on appeal is attached as an Appendix.

IV. Status of Amendments Filed After Final

No Amendments were filed following the final rejection.

V. Summary of Claimed Subject Matter

The present invention is directed to a method of manufacturing a post patient collimator assembly. In certain medical imaging assemblies such as computer tomography imagers photons are absorbed by scintillator elements in order to produce the medical images. Collimator elements are uses in conjunction with the scintillator to limit the direction of photons as they approach the scintillator element. The cost of manufacture and the increasing accuracy if manufacturing tolerances press for improvements in the manufacturing process. The process and claims recite terms and process steps that the Applicant believes to be clear and concise and would be well understood by one skilled in the art. The Examiner believes these terms to be indefinite and unsupported. The present appeal will provide the Board with sufficient information by which to determine which position holds merit.

With reference to Figs. 1-6 and the description in paragraphs 18-21, Claim 1 recites a method for manufacturing a collimator assembly 10 (para. 18, lines 1-3) including the step of sintering a tungsten powder and a glass powder mixture to form a first collimator tube 14 (para 18, lines 10-19). A first core element 12 is placed within a first center collimator path 18 of the

first collimator tube 14 to create a first base-tube couple 16 (para 19, line 1-3). The couple cross-section 24 of the first base-tube couple 16 is then reduced such that the first base-tube couple 16 becomes a first single-fiber fiber 26 (para 19, lines 1-13, figure 3). The resultant single-fiber fiber 26 is then assembled into a collimator group 28 (para 19, lines 21-25). Finally the first core element 12 is dissolved such that a first hollow fiber 52 is generated (para 22, lines 4-7).

Claim 12 is also an independent claim which recites the essential limitations of claim 1 however broadly reciting a high-z powder rather than the tungsten powder recited in claim 1 (para 18, lines 8-20 reciting high-z glass, reciting the glass comprising a recitation of a plurality of high-z materials, and finally reciting that the scintering of tungsten powder (a high-z material) into glass powder to increase the density and x-ray stopping powder of the collimator tube 14). Claim 12 further recites a plurality of single-fiber fibers rather than the at least one recited in claim 1.

VI. Grounds of Rejection to be Reviewed on Appeal

The following issues are presented in this appeal:

A. Whether claims 1-4, 6-16 are properly rejected under 35 USC 112, first paragraph as failing to comply with the written description requirement.

B. Whether claims 1-4, 6-16 are properly rejected under 35 USC 112, second paragraph as being indefinite for failing to particularly point out and distinctly claim the subject matter.

VII. Argument

A. The Rejection of Claims 1-16 Under 35 USC §112, First Paragraph

Claims 1-4, 6-16 were rejected under 35 USC 112, first paragraph as failing to comply with the written description requirements. The Applicant respectfully traverses and requests the Boards reconsideration. Claim 5 has been cancelled from the case.

- The Examiner states he could find no support for the newly claimed "sintering a high-z powder and glass powder mixture to form a first collimator tube". Respectfully, the Applicant requests reconsideration.
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    - **The applicant quotes from the specification as filed:**

"It is further contemplated that **in one embodiment the collimator tube 14 may be comprised of any of the following ingredients:** lead oxide (PbO), bismuth oxide (Bi_2O_3), tantalum oxide (Ta_2O_5), tungsten oxide (WO_3), thorium oxide (ThO_2), hafnium oxide (HfO_2), silicon oxide (SiO_2), potassium oxide (K_2O), boron oxide (B_2O_3), aluminum oxide (Al_2O_3), gallium oxide (Ga_2O_3), germanium oxide (GeO_2), cerium oxide (CeO_2), and antimony oxide (Sb_2O_3)**. In still another embodiment, metal tungsten powder can be added to the glass and sintered in with the glass powder to increase the density and x-ray stopping power**. "

The Applicant asserts that this paragraph clearly describes making the collimator tube from tungsten powder sintered with glass powder.

Furthermore the very definition of **SINTERING** can be found consulting Wikipedia:

Sintering is a method for making objects from powder, by heating the material (below its melting point) until its particles adhere to each other. Sintering is traditionally used for manufacturing ceramic objects, and has also found uses in such fields as powder metallurgy.

From this definition and the above paragraph, no other conclusion is available to one skilled in the art that the specification is describing scintering tungsten powder and glass powder in a described embodiment to form the collimator tube 14. If this were not sufficient, claim 21 as filed further reinforces this:

"**said drawn glass collimator tube comprises tungsten powder sintered into glass powder".** The definition of sintering would not allow the Examiner's construction suggesting that sintering somehow turns tungsten powder into glass powder. Instead, anyone skilled in the art would clearly understand the specification and claim to be describing a glass tube formed by sintering glass powder and tungsten powder together.

The Examiner has failed to provide any support for his assertion that glass powder and tungsten powder cannot be sintered into a glass tube as claimed. His sole basis is that these

two ingredients (glass and tungsten) are taught by MacCragh to make cerment. The Applicant respectfully disagrees with this assertion.

- The Applicant calls the Board's attention to the Webster's New World Collegiate dictionary 3rd edition which defines cermet as:
  - "a mixture of ceramic material and metal, that is tough and heat resistant; used in gas turbines, nuclear reactors, rocket motors, etc.
  - Glass with a small amount of metal mixed in does not cease to be glass and surely does not become cerment. No more so that reflective metallic particles (done for tinting) put in an automobile windshield turn the windshield into a cerment windshield instead of a glass-windshield. The Examiner has failed to provided support for the argument that sintering tungsten with glass cannot result in glass but only results in cerment. The MacGragh reference does not support this argument. It simply states that in some proportions, tungsten and silicon may be combined to form cerment. MacGragh does not define cerment. If a single particle of tungsten was added to glass would it still be cerment or would it still be glass? MacGagh is silent on this fact. Furthermore, glass is NOT silicon alone.
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B. The Rejection of Claims 1-4, 6-16 Under 35 USC §112, Second Paragraph

Claims 1-16 were rejected under 35 USC §112, second paragraph, as indefinite. The Applicant respectfully traverses and requests the Board's consideration.

- The Examiner argues that claim 9 contains new limitations which are not supported "even remotely". The Applicant calls the Board's attention to the specification as filed:
  - "After fusion of the block 36, a disc 44 can be cut off of the block 36 across the fiber axis 46 (see figures 7 and 8). The disc 44 is preferably cut to a desired collimator depth 48. The desired collimator depth 48 can be determined by the scattering reduction requirements of the collimator assembly". It is well known in the art that the Purpose of tailoring a collimator depth is to affect is performance characteristics. There can be no doubt that no unsubstantiated limitations were added.

- The paragraph above clearly teaches that the block 36 can be cut to a desired depth and that the collimator depth 48 can be determined by tailoring it to collimator performance.

- The Examiner argues claims 4 and 6 go to alternate embodiments. The Examiner argues there is no basis for combining them and alludes to the use of the word "another" in the specification. The examiner is mistaken: tungsten powder and glass powder can be sintered into a high-z glass tube (see above) so claim 4 need not read on another embodiment. Furthermore, there is no conflict between the tungsten powder additive and the other additives described.
- The Examiner deems the term "high-z" indefinite. The Examiner is encouraged to consult just a few of the following resources to see that both the industry AND the patent office itself recognizes High-Z as a clearly defined term within the art:
  - **http://www.lanl.gov/quarterly/q_spring03/muon_text.shtml**
    - **wherein the well-recognized Los Alamos laws defines high-z as :**

> The new technique uses the fact that muons are more strongly deflected, or scattered, by nuclear or gamma-ray-shielding materials than they are by materials such as plastic, glass, and aluminum. This enhanced deflection occurs mainly because the atomic nuclei of nuclear and gamma-ray-shielding materials contain large numbers of protons, which exert large electrostatic forces on muons passing nearby. Since the number of protons is given by the atomic number Z, such materials are called "high-Z" materials.

OR Oxford Journals who utilized this term consistently when authors skilled in the art are writing papers:

http://rpd.oxfordjournals.org/cgi/content/abstract/17/1-4/67

http://rpd.oxfordjournals.org/cgi/content/abstract/33/1-4/183

But perhaps most tellingly the USPTO has issued patents utilizing the term high-z without concern for its indefiniteness:

4,208,577

4,269,899

6,519,313

The Applicant respectfully requests reconsideration.

VIII. Appendix

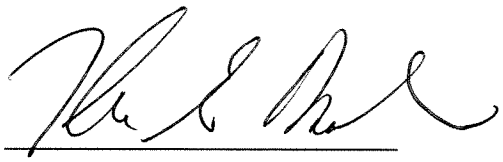
A copy of each of the claims involved in this appeal, namely Claims 1-4 and 6-16 are set forth and attached as Appendix A. Claims 17-22 that have been withdrawn from the case are set forth for completeness. Claim 5 has been cancelled from the case.

IX. Conclusion

For the foregoing reasons, Appellant respectfully requests that the Board direct the Examiner in charge of this examination to withdraw the rejections.

Please charge the fee for filing the Appeal Brief to Deposit Account 07-0845. Please credit any overpayment or charge any additional fees required in the filing of this appeal to deposit account 07-0845.

Respectfully submitted,



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Date: January 3, 2008

APPENDIX A

1. (Rejected/Appealed) A method of manufacturing a collimator assembly comprising:

sintering a tungsten powder and a glass powder mixture to form a first collimator tube;

placing a first core element within a first center collimator path of said first collimator tube to create a first base-tube couple;

reducing a couple cross-section of said first base-tube couple such that said first base-tube couple becomes a first single-fiber fiber;

assembling said first single-fiber fiber into a collimator group; and

dissolving said first core element such that a first hollow fiber is generated.

2. (Rejected/Appealed) A method of manufacturing a collimator assembly as described in claim 1, wherein said reducing a couple cross-section comprises:

heating said first base-tube couple; and

drawing said first base-tube couple.

3. (Rejected/Appealed) A method of manufacturing a collimator assembly as described in claim 1, wherein:

said first collimator tube comprises a cladding glass tube;

said first core element comprises a glass core; and

said first core element comprises a first glass transition temperature, said first collimator tube comprises a second glass transition temperature, said first glass transition temperature and said second glass transition temperature are substantially identical.

4. (Rejected/Appealed) A method of manufacturing a collimator assembly as described in claim 1, wherein said first collimator tube comprises high-Z glass.

5. (Cancelled)

6. (Rejected/Appealed) A method of manufacturing a collimator assembly as described in claim 1, wherein said first collimator tube comprises material taken from the group consisting of lead oxide, bismuth oxide, tantalum oxide, tungsten oxide, thorium oxide, hafnium oxide, silicon oxide, potassium oxide, boron oxide, aluminum oxide, gallium oxide, germanium oxide, cerium oxide, and antimony oxide.

7. (Rejected/Appealed) A method of manufacturing a collimator assembly as described in claim 1, further comprising:

producing a plurality of additional single-fiber fibers;

arranging said plurality of additional single-fiber fibers into a first multi-fiber bundle;

reducing said first multi-fiber bundle to generate a multi-fiber fiber; and

assembling said multi-fiber fiber into the collimator assembly.

8. (Rejected/Appealed) A method of manufacturing a collimator assembly as described in claim 7, further comprising:

producing a plurality of additional multi-fiber fibers;

arranging said plurality of additional multi-fiber fibers into a block; and

fusing said additional multi-fiber fibers.

9. (Rejected/Appealed) A method of manufacturing a collimator assembly as described in claim 8, further comprising:

slicing said block to a desired collimator depth such that a plurality of collimator assemblies may be produced from said block with varied collimating characteristics.

10. (Rejected/Appealed) A method of manufacturing a collimator assembly as described in claim 1, wherein said dissolving said first core comprises:

placing said the collimator assembly into a water based acid bath.

11. (Rejected/Appealed) A method of manufacturing a collimator assembly as described in claim 1, wherein said first collimator tube comprises an insoluble collimator tube; and said first core element comprises a soluble core element.

12. (Rejected/Appealed) A method of manufacturing a collimator assembly comprising:

producing a plurality of single-fiber fibers, each of said single-fiber fibers produced by:

sintering a high-z powder and a glass powder mixture to form a first collimator tube;

placing a core element within a center collimator path of said collimator tube to create a base-tube couple; and

reducing a couple cross-section of said base-tube couple such that said base-tube couple becomes a single-fiber fiber;

arranging said plurality of single-fiber fibers into a first multi-fiber bundle; and

dissolving said core elements such that a plurality of hollow fibers is generated.

13. (Rejected/Appealed) A method of manufacturing a collimator assembly as described in claim 12, further comprising:

reducing said first multi-fiber bundle to generate a multi-fiber fiber;

producing a plurality of said multi-fiber fibers;

arranging said plurality of multi-fiber fibers into a block; and

fusing said plurality of multi-fiber fibers.

14. (Rejected/Appealed) A method of manufacturing a collimator assembly as described in claim 12, wherein said reducing a couple cross-section comprises:

heating said base-tube couple; and

drawing said base-tube couple.

15. (Rejected/Appealed) A method of manufacturing a collimator assembly as described in claim 12, wherein:

said collimator tube comprises a cladding glass tube;

said core element comprises a glass core; and

said core element comprises a first glass transition temperature, said collimator tube comprises a second glass transition temperature, said first glass transition temperature and said second glass transition temperature are substantially identical.

16. (Rejected/Appealed) A method of manufacturing a collimator assembly as described in claim 12, wherein said dissolving said core elements comprises:

placing said core elements into a water based acid bath.

17. (Withdrawn) A collimator assembly comprising:

a plurality of hollow collimator fibers, each of said plurality of hollow collimator fibers comprising a drawn glass collimator tube having a center collimator path, said center collimator path maintained during said drawing by way of a core element positioned within said center collimator path, said center collimator path hollowed after said drawing by way of dissolving said core element.

18. (Withdrawn) A collimator assembly as described in claim 17, further comprising:

a plurality of multi-fiber fibers, each of said plurality of multi-fiber fibers comprised of a plurality of said hollow collimator fibers assembled and drawn into said multi-fiber fiber.

19. (Withdrawn) A collimator assembly as described in claim 18, further comprising:

a fused block of said plurality of multi-fiber fibers.

20. (Withdrawn) A collimator assembly as described in claim 17, wherein said drawn glass collimator tube comprises high-Z glass.

21. (Withdrawn) A collimator assembly as described in claim 17, wherein said drawn glass collimator tube comprises tungsten powder sintered into glass powder.

22. (Withdrawn) A collimator assembly as described in claim 17, wherein said drawn glass collimator tube comprises material taken from the group of lead oxide, bismuth oxide, tantalum oxide, tungsten oxide, thorium oxide, hafnium oxide, silicon oxide, potassium oxide, boron oxide, aluminum oxide, gallium oxide, germanium oxide, cerium oxide, and antimony oxide.

EVIDENCE APPENDIX

None.

RELATED PROCEEDINGS APPENDIX

None.